WHAT IS CLAIMED IS:

1. An audio-signal-processing apparatus comprising:

a band-decomposition unit, having a decomposition characteristic, operable to decompose a low frequency component of input-audio-signals into a plurality of frequency components that have different frequency bands based on the decomposition characteristic;

a harmonic-series-generating unit operable to generate a harmonic-tone component based on at least one of the plurality of frequency components; and

a composition unit operable to compound the input-audio-signals and the harmonic-tone component generated by said harmonic-series-generating unit.

2. The audio-signal-processing apparatus of claim 1, wherein said band-decomposition unit is operable to decompose the low frequency component of each of a fundamental tone and harmonic-tones of the fundamental tone such that each belongs to a different frequency band.

3. The audio-signal-processing apparatus of claim 1, wherein the decomposition characteristic is defined based on a lowest fundamental frequency of musical instruments.

4. The audio-signal-processing apparatus of claim 1, wherein the decomposition characteristic is defined based on a low interval limit.

5. The audio-signal-processing apparatus of claim 1, wherein a band width of each of the different frequency bands is from 15Hz to 50Hz.

6. The audio-signal-processing apparatus of claim 1, wherein a band width of each of the different frequency bands is from 15Hz to 30Hz.

7. The audio-signal-processing apparatus of claim 1, wherein said band-decomposition unit comprises a low-pass filter extracting frequency components in a lowest register.

8. The audio-signal-processing apparatus of claim 1, wherein said band-decomposition unit comprises a band-pass filter having a low cut-off frequency lower than a lowest fundamental frequency of musical instruments.

9. The audio-signal-processing apparatus of claim 1, further comprising

a delay device operable to compensate for a processing delay between the harmonic-tone component and the input-audio-signals.

10. The audio-signal-processing apparatus of claim 1, further comprising

a gain control device operable to adjust a gain of the input-audio-signals and a gain of the harmonic-tone component generated by said harmonic-series-generating unit.

11. An audio-signal-processing apparatus comprising:

a sum component output unit operable to receive input-audio-signals of a first channel and input-audio-signals of a second channel and output a sum component of the input-audio-signals of the first channel and the input-audio-signals of the second channel;

a band-decomposition unit, having a decomposition characteristic, operable to decompose the sum component into a plurality of frequency components that have different frequency bands based on the decomposition characteristic;

a harmonic-series-generating unit operable to generate a harmonic-tone component based on at least one of the plurality of frequency components;

a first composition unit operable to compound the input-audio-signals of the first channel and the harmonic-tone component generated by said harmonic-series-generating unit; and

a second composition unit operable to compound the input-audio-signals of the second channel and the harmonic-tone component generated by said harmonic-series-generating unit.

12. An audio-signal-processing method comprising:

decomposing a low frequency component of input-audio-signals into a plurality of frequency components that have different frequency bands based on a decomposition characteristic;

generating a harmonic-tone component based on at least one of the plurality of frequency components; and

compounding the input-audio-signals and the generated harmonic-tone component.

13. The audio-signal-processing method of claim 12, wherein said decomposing of the low frequency component of the input-audio-signals into the plurality of frequency components that have the different frequency bands based on the decomposition characteristic is such that each of a fundamental tone and harmonic-tones of the fundamental tone belongs to a different frequency band.

14. The audio-signal-processing method of claim 12, wherein the decomposition characteristic is defined based on a lowest fundamental frequency of musical instruments.

15. The audio-signal-processing method of claim 12, wherein the decomposition characteristic is defined based on a low interval limit.

16. The audio-signal-processing method of claim 12, wherein a band width of each of the different frequency bands is from 15Hz to 50Hz.

17. The audio-signal-processing method of claim 12, wherein said decomposing of the low frequency component of the input-audio-signals into the plurality of frequency components that have the different frequency bands based on the decomposition characteristic uses a low-pass filter extracting frequency components in a lowest register.

18. The audio-signal-processing method of claim 12, wherein a band width of each of the different frequency bands is from 15Hz to 50Hz.

19. The audio-signal-processing method of claim 12, further comprising

compensating for a processing delay between the generated harmonic-tone component and the input-audio-signals.

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20. The audio-signal-processing method of claim 12, further comprising

adjusting a gain of the input-audio-signals and a gain of the generated harmonic-tone component.